

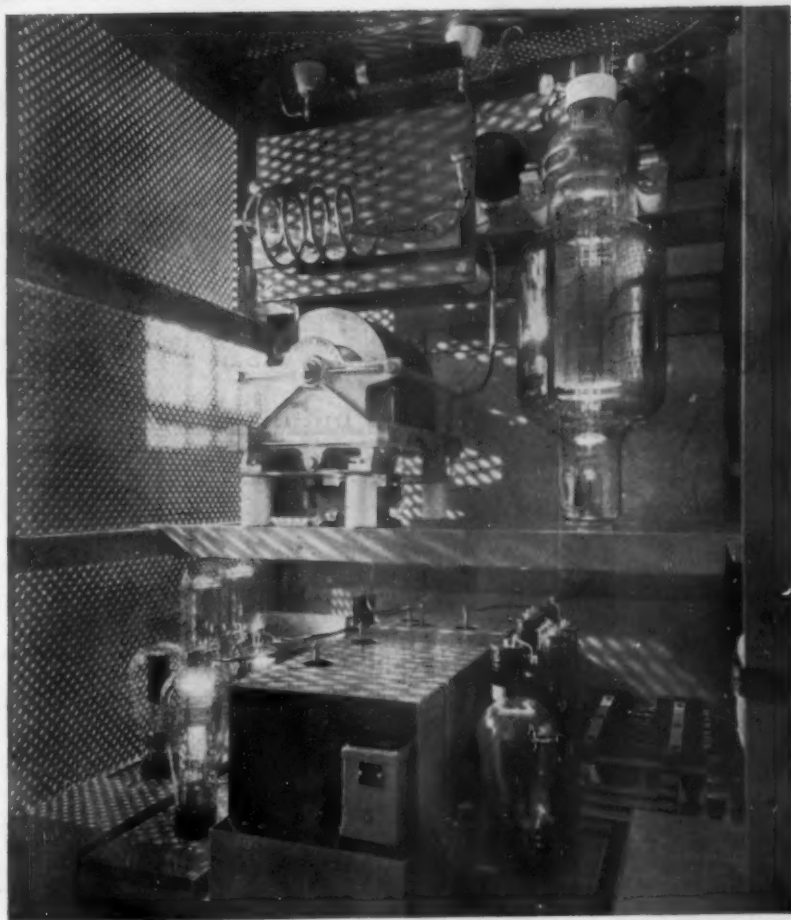
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



NOVEMBER 3, 1934

Hello—Central America?

See Page 280

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DO YOU KNOW?

Bermuda was the first British colony.

The Nile River rises about twenty feet in its annual flooding of Egyptian land.

The first cancer hospital was opened in Rheims, France, in 1740 and had just twelve beds.

The narcissus bulb industry in Florida is reported to be recovering from its depression slump.

Indians of the Southwest used roots of wild plants containing saponin as "soap" for washing purposes.

The Soviet Union reports that a vaccine to prevent spotted typhus fever has been discovered there, giving highly satisfactory results.

For 1,000 years poultry was bred for fighting exhibitions; for fifty years it has been bred for egg production, says a poultry expert at Cornell, urging a program of more balanced poultry improvement to include size of bird, longevity of stock and vitality of chicks.

A health and disease survey at Zuni Pueblo in New Mexico shows a death rate of 42 per thousand, almost four times the country's general death rate.

A New York botanist warns that raking all the leaves out of shrubbery in the fall is responsible for much winter injury to shrubs thus left unprotected.

A California company finds that it can use a bread-wrapping machine to wrap eggs in waxed paper cartons, and that eggs thus protected from moisture and air keep better than unwrapped eggs.

The United States is the world's chief source of peppermint oil, more than 25,000 acres of mint being grown in Michigan, Indiana, and Washington alone.

A physician observes in the journal *Hygiea*, that out of 173 doctors whose obituaries were published in a medical journal in one month, 100 died of diseases of the heart and circulation, which are peculiarly diseases of worry or nervous tension.

WITH THE SCIENCES THIS WEEK

AGRICULTURE

What crops protect against erosion? p. 286. *Plant Ecology*—John E. Weaver and Frederic E. Clements—McGraw-Hill, 1929, \$5.

ASTRONOMY

What is the earth made of? p. 282. *The Two Solar Families*—Thomas C. Chamberlin—Univ. of Chicago, 1928, \$2.50.

BIOCHEMISTRY

What is the new rickets-preventing substance made from? p. 285.

CHEMISTRY

What is the structure of Vitamin B like? p. 284.

DENDROLOGY

What tree was 269 feet high? p. 285.

ENGINEERING

How can railroads save money? p. 281.

What will take the place of locks on the Oder River? p. 282.

MEDICINE

How many pounds of liver (or its equivalent) must the anemia patient eat? p. 277.

What disease may be caused by arsenic spray on vegetables? p. 280.

What factor aided Dr. Whipple in his search for anemia treatment? p. 275.

What gland may be a cause of stomach ulcers? p. 286.

What is the canine counterpart of influenza? p. 283. *Recent Advances in Vaccine and Serum Therapy*—Alexander Fleming and G. F. Petrie—Blakiston's, 1934, \$4.

OCEANOGRAPHY

Where does the Gulf Stream originate? p. 284.

ORNITHOLOGY

To what bird is the ptarmigan related? p. 276.

What industry menaces the bald eagle? p. 281.

Where does the Harris' sparrow summer? p. 281.

PHARMACY

Does medicine have to be bitter? p. 280.

PHYSIOLOGY

How fast must a flashing light flicker to appear like a steady beam? p. 280.

What animal helped in the conquest of pernicious anemia? p. 276.

PSYCHIATRY

Should fairy stories be prohibited for children at bedtime? p. 278.

TECHNOLOGY

How is rubber wrapping sealed? p. 280. *Symposium on Rubber*—American Society for Testing Materials, 1932, \$1.75.

These curiosity arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but the references for further reading. Books cited can be supplied by Book Departments Science News Letter, at publishers' prices, postpaid in the United States.



WINNERS OF THE NOBEL PRIZE IN MEDICINE, 1934

Dr. George H. Whipple, (left) of the University of Rochester, Dr. George R. Minot, and Dr. William P. Murphy, (right) of Harvard Medical School, have now been honored for their great conquest of the dread disease pernicious anemia.

MEDICINE

Conquest of Anemia One Of Medicine's Great Epics

Diagnosis, "Pernicious Anemia," Was Not Long Ago A Death Warrant; Conquerors Receive Nobel Prize

ONCE when a doctor shook his head and said: "pernicious anemia," it was a death warrant executed in two or three years by the slow progress of this blood disease.

In 1926 the medical world was thrilled, as it is occasionally by some great advance, by reports from Harvard Medical School that liver, the ordinary calf or beef liver of that tasteful liver and bacon dish, was capable of conquering pernicious anemia.

Today the disease fighters who made mankind unafraid of one more disease are honored for their work by that highest of science's awards, the Nobel prize in medicine.

As insulin subdued the toll of diabetes, so liver is a specific for pernicious anemia. And as the achievement of insulin was crowned by a Nobel award to the group responsible, so liver for anemia is now recognized.

Like many great discoveries in science, the conquest of this disease of the

bone marrow, a disease that prevents the formation of enough vigorous red blood cells, came slowly. The first act occurred in the animal experiment laboratories of Dr. George H. Whipple of the University of Rochester. The second act came when Dr. George R. Minot of Harvard Medical School seized upon Dr. Whipple's results and reprieved by the grace of science pernicious anemia patients.

It seemed simple after it was done. The patient ate large quantities of liver—as much as half a pound a day. That is, it was simple if the patient happened to like liver but most of them did not.

Since then the treatment is dietetically less heroic for the material in liver that counteracts the disease has been extracted and it is only necessary for the patient to take relatively small doses of extract.

But in the early days, the patients ate liver and they had to like it. One incidental effect when the news got around was that perfectly well people who did not need to eat liver to save

themselves from death decided to eat more liver. The price shot upward under increased demand which did not help the economics of combating the disease.

Within the first four years after announcement of the treatment in 1926, life insurance statisticians found that the mortality from this disease for white persons had been reduced by about half between the ages of 55 and 74 years in which range formerly the heaviest mortality from this disease had occurred. At the same time, pathologists in medical schools were finding themselves hampered in their teaching because they could not find a sufficient number of patients suffering from the disease to be used in showing medical students how this disease affects the body.

Perhaps it was because he suffered from diabetes and thus learned firsthand the vital importance of scrupulous attention to diet that Dr. Minot discovered the value of liver in treating pernicious anemia. According to reports, it was while he was weighing every morsel of his own food, before the discovery of insulin, that he began to investigate the eating habits of his pernicious anemia patients. He found them finicky eaters, over-fond of fats and disliking meat and other protein foods. Then he heard of Dr. Whipple's laboratory experiments.

The University of Rochester scientist had given dogs another kind of anemia—simple anemia—and had found that

feeding liver or muscle meat cured their anemia. Dogs do not get pernicious anemia, and the two kinds—simple and pernicious anemia—are quite different. Furthermore, muscle meat such as beefsteak had never helped pernicious anemia patients.

Still, Dr. Minot decided to give liver a trial, perhaps spurred on to this decision by the knowledge that liver was being found valuable in pellagra and sprue, two diseases which had certain similarities to pernicious anemia.

The striking improvement in the first

liver-fed pernicious anemia patients seemed too good to be true, so Dr. Minot enlisted the unprejudiced aid of another physician, Dr. William P. Murphy of Harvard Medical School. Without telling Dr. Murphy of his own results and hopes, he persuaded the latter to try liver feeding for pernicious anemia. When Dr. Murphy's liver-fed patients showed the same striking improvement Dr. Minot felt sure enough of the method to make the first public announcement at a scientific meeting.

Science News Letter, November 3, 1934

PHYSIOLOGY

Anemia Research Began With No Thought of Application

By DR. GEORGE H. WHIPPLE,
University of Rochester Physiologist,
Nobelist in Medicine, 1934.

UNPREDICTABLE by-products of research in physiology are rarely brought to the attention of the layman.

The studies which led to the appreciation of liver as a food to promote hemoglobin regeneration were taken up with no idea of any clinical application. We wished to find out how the body built up hemoglobin and what materials could best be utilized by the body.

These studies are still being carried forward to determine what elements of food are most essential to make new hemoglobin. Dogs are best suited for these studies and all work has been done on these animals. They are frequently

used to standardize liver fractions to be used in the treatment of human disease.

Future progress in the control of other diseases can not be predicted with any certainty, but if history has any significance it points to future by-products coming from investigations in the wide field of pure science which will enable the physician to bring under control still other diseases which afflict human kind.

It is never safe to state that any bit of accurate knowledge about body physiology is useless for in the future some student may sense its application to the study of some particular disease state. Progress is often made by way of detours which look very unfavorable at first.

Science News Letter, November 3, 1934

MEDICINE

Nobel Prizeman Simplifies Liver Treatment of Anemia

A MORE effective, more convenient and cheaper liver extract for controlling pernicious anemia is the latest achievement of Dr. William P. Murphy, one of the trio of American scientists whose conquest of this disease was crowned by the Nobel medical prize announced last week.

Instead of a patient's eating a quarter to half pound of liver daily or swallowing three doses of the older less con-

centrated liver extract daily, the new liver extract is injected in a muscle only once monthly.

Developed at Peter Bent Brigham Hospital, Boston, with the cooperation of Dr. Guy W. Clark of the Lederle Laboratories, the new concentrated extract for intramuscular injection is expected to reduce the difficulties and expense of treating unfortunate victims of this disease. Dr. Murphy made

known the possibilities of the new extract in responding to a Science Service request for comment on his latest work.

The average pernicious anemia patient to keep well must:

Eat eleven pounds of liver during each month, costing about \$5.50, or

Take by mouth a potent liver extract, three vials daily, or 84 doses during each month, costing approximately \$17.00, or

If the new Murphy-Clark extract is used, one shot into a muscle once monthly, the extract costing only \$1.20.

The death rate from pernicious anemia at ages 30 to 50 years has been only half so great since liver treatment came into use, Dr. Murphy explained. He predicted further reductions and that there need be no deaths if patients cooperate.

Science News Letter, November 3, 1934

ORNITHOLOGY

First "Eskimo Chicken" Raised in Captivity

THE FIRST "Eskimo chicken," or ptarmigan, ever to be raised in captivity was described before the recent meeting of the American Ornithological Union in Chicago, by its foster-parent, Prof. A. A. Allen of Cornell University. (See SNL, Aug. 4, p. 77). Although now living far to the south of any country known to ptarmigan, at least since Ice Age times, this friendly little bird of the Arctic has adapted itself well to its environment, and has not presented any infancy troubles beyond those shown by the more familiar ruffed grouse, which has already been raised in captivity by Prof. Allen.

The bird is now changing into its winter white coat of feathers, and is at present in a sort of half-and-half uniform—dark summer plumage above and winter white underneath. Moulting in this species differs from that in other birds in that it seems to be a continuous process throughout the year.

The rearing of this ptarmigan chick on the Cornell University campus was one result of a three thousand mile expedition to Churchill, Manitoba, on which Prof. Allen was sent last June, under the auspices of the Grouse Investigation Committee of the American Game Association, to further the studies of the ruffed grouse which he has been making for many years. He sent back a considerable number of ptarmigan eggs, but only one hatched.

Science News Letter, November 3, 1934

MEDICINE

New Anemia Treatment Described by Dr. Murphy

Injection Once Monthly Substitutes for Daily Diet Of Liver or Extract Doses And Yet Is Cheaper

By DR. WILLIAM P. MURPHY,
Nobel Prize in Medicine, 1934

IT GIVES me great pleasure to have this opportunity to briefly comment upon the work in which Dr. Minot and I have cooperated during the past ten years, and for which we have received the highest honor which it is possible for a physician to receive—awarded by the Nobel Prize Committee of the Carline Institute of Stockholm, Sweden.

Since our initial work on the treatment of pernicious anemia by the use of liver, as carried out in our office practice and at the Peter Bent Brigham Hospital and the Collis P. Huntington Hospital in Boston, much progress has been made in the direction of improvement and simplification of treatment of the unfortunate victim of this disease.

Although the amount of liver necessary for each patient's needs may vary greatly it is necessary for him to take daily an average of from one fourth to one half pound, or during each month a total of eleven pounds in order to keep well. If instead of taking liver the patient is advised to take a potent liver extract by mouth it will be necessary to use daily three vials or doses and in a month eighty-four vials or doses in order to replace the effect of the liver. The average cost of eleven pounds of liver will be about \$5.50, whereas the cost of the eighty-four doses will be approximately \$17.00.

Replaced By Injection

Contrast the difficulties and expense of such a regimen with that which is now possible through the development at the Peter Bent Brigham Hospital with the cooperation of Dr. Guy W. Clark of the Lederle Laboratories, of an extract of liver which may be injected into the muscle and which is so concentrated that it is necessary to use only one injection to replace the eleven pounds of liver or eighty-four doses of liver extract if taken by mouth. And

this concentrated extract for intramuscular injection costs but \$1.20.

Is not such a saving worth while at a time when each and every one of us feels the need for the greatest economy? If one is to realize that treatment by means of this material costs even less than does the liver, is more effective in controlling the disease and is so much more convenient to take, I am sure that we can all agree that progress in the direction of simplification of treatment for patients with this disease is being made.

Let us consider the evidence that progress is being made in the control of this disease as judged on another basis.

The Metropolitan Life Insurance Company has recently compared the death rate from pernicious anemia for the period since 1926 when liver treat-

ment came into general use with a like interval before 1926 when this treatment was not available. They observed that the death rate in individuals with pernicious anemia between the ages of 30 and 50 years has been only half so great since the use of liver as it was before. Above the age of 50 the death rate has not shown such a striking decrease, no doubt owing to complications which are more likely to occur during the older age period.

No Deaths

I feel sure that the death rate will be further reduced and that there need be no deaths from this disease if each patient will continue to take regularly in some form an adequate amount of liver substance as prescribed by his physician. The amount of liver substance necessary must be determined on the basis of regular determinations of the number of red blood cells and the patient's physical condition. It is our hope that even further progress in this direction will be made as others continue to take up the problem with us.

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A Viennese has obtained a patent for producing synthetic diamonds by a process that may prove useful for industrial diamonds.



CHANGING TO WINTER CLOTHES

This bird, the first ptarmigan to be raised in captivity, is now putting on his cold-weather coat of white. He is perched in friendliness on the shoulder of David Allen, young son of the scientist who is making a study of these Arctic relatives of the ruffed grouse.

PSYCHIATRY

Tell Fairy Stories to Your Children

But Be Careful, Warns the Psychiatrist; Tale Should Not Be Frightening When Told at Bedtime

By JANE STAFFORD

REMEMBER Hansel and Gretel and the fearful witch, Sleeping Beauty, and all the other fairy tale characters which frightened and thrilled you as a child? Remember how real they seemed to you then, as much a part of your life as your parents and playmates?

The fairy stories you heard when you were five or six played a big part in your development, bigger than you probably realized. Psychiatrists have traced the effect of these tales and find that their influence extends into adult life.

Just as the good fairies helped the hero and the bad fairies injured him, so the stories themselves may have helped or harmed you. How they have affected your grown-up self depends somewhat on your temperament and nervous make-up as a child and somewhat on how the stories were told to you.

A case of a grown man who still lived in an imaginary fairy-tale world was recently described by Dr. Sandor Lorand, New York psychiatrist, as an example of the harm fairy stories can do under certain circumstances.

Unwanted Companions

The man was in his thirties and accomplished in his social and economic status, financially independent, married and the father of a child. But the city streets on which he moved, the house where he lived, the meadows and forests where he played golf, the lakes where he went fishing were all filled up for him with giants, ogres, witches and strange animals. He lived in constant dread of seeing the faces of his friends turn into bird-faces with beaks for noses. In his dreams strange prehistoric animals reached through the window, and big and baby elephants, snakes and the wolf of Little Red Riding Hood were all present.

These creatures of his imagination were, in the popular phrase, driving him nearly crazy. As the psychiatrists

would describe it, he was suffering from a neurosis and was obsessed with fears.

The fairy tales were not entirely responsible for this man's condition, Dr. Lorand explained. The underlying cause was an Oedipus complex from which the patient had suffered as a child and which he had never really outgrown. Psychiatrists use this term, named for the Greek hero who unwittingly killed his own father, to describe a boy's abnormal devotion to his mother and consequent jealous hatred of his father.

Happiest Moments

In the case Dr. Lorand described, the patient was left alone with his mother much of the time. In the evening, while waiting for the father to return home, his mother would tell him fairy stories and the patient remembered these moments as the happiest in his life. The fairy tales at that time eased and partially solved the Oedipus situation and the other childhood conflicts the patient faced. But the situation was never entirely cleared up and when it arose again in his adult life, the patient unconsciously turned back to the fairy tales which had given relief in his childhood. Only this time the stories failed him. Instead of easing the situation they aggravated it. As a child he had been the triumphant hero of the stories, but as an adult he was the unsuccessful hero, and lived in constant fear of the imaginary beasts and witches and ogres. At the same time he was in terror lest the world find out that he was being haunted by them, for he was not too "crazy" to know that however real these fearsome creatures were to him, they were not real to the rest of the world.

A few years ago, when psychiatrists first learned from cases like this the powerful and sometimes injurious influence that fairy tales might have, a movement was started to ban all fairy stories for children. This was wrong, in Dr. Lorand's opinion.

The child of two, three and four years old needs a fairy tale and a good

RULES FOR TELLING FAIRY STORIES TO CHILDREN

1. Select the story according to the age of the child.
2. Do not tell very fearsome stories to very young children.
3. Pleasant stories like Sleeping Beauty are better than ones filled with witches and ogres. Pinocchio can be made too frightening.
4. Both parents should tell fairy stories to their children.
5. Be careful of the tones of your voice: do not make the ogre too realistic; do not let the child know that you are bored and telling the story solely from a sense of duty.
6. Do not let the story become an outlet for yourself but remember the child for whom you are telling it.
7. Stories for children should have happy endings.

one, Dr. Lorand holds. But it must be told him in the right way.

Fairy stories are important because they relieve a child of worries over mysteries which he cannot understand, Dr. Lorand explained. Every child wants to find out the great mystery of where children come from and what parents have to do with it. Every child also wants to know whether his parents love him. He is reassured on this last point by the fact of his parents telling him the stories and also somewhat by the content of the stories. For in the child's mind the characters of the stories have some relation to his parents. He likes to see himself as the hero and his parents as the kind fairies helping him and rewarding him for good conduct.

Sometimes, particularly if he is a nervous child, he may identify one or both of his parents with the bad fairies who are fighting the hero. This may create a frightening and confusing situation. There should not be too many witches and ogres in stories told to children, says Dr. Lorand, and parents

should be careful not to make the ogres too realistic. He himself recalls to this day the terror inspired in him as a small boy by his elder brother who playfully but too realistically impersonated an ogre with fearsome, deep voice and grotesque facial expression.

Besides reassuring the child of parental love, fairy stories provide a happy make-believe world to which he can turn for refuge from the confusion and unpleasantness of the real world in which he is growing up. You can appreciate this if you consider the way in which an exciting novel or a romantic movie lets you escape for a time from the worries and troubles of your own life. The bewildered little child must have some such way of escape from reality until he or she is old enough to understand life instead of being hopelessly confused by it.

Temporary Escape

When you pick up a detective story to take your mind off your troubles, it is only as a temporary expedient, and you expect to face and solve the problems later. With some children, there is danger that the escape from reality into a pleasant fairy story world may become a permanent reaction to diffi-

culties. In this way the fairy tale may confuse the mental life of the child so as to leave permanent injuries which may prevent his future adjustment to the world, Dr. Lorand pointed out. This was what happened to the patient whose case he reported.

In a case like this, however, it is not the fairy tale in itself that does the harm, Dr. Lorand emphasized. The child was already in a confused state and unable to adjust himself satisfactorily to the growing-up process. He wanted to remain a baby in his mother's lap, the chief object of her interest and affection. Fairy tales help some children make the change from mother's baby to an independent personality, but they make the change harder for other children and may keep them from ever making it properly.

"The fact that stories may have both good and ill effects renders very important the circumstances under which they are related to the child, for it is on these circumstances that the effect in large measure depends," Dr. Lorand asserted.

Advice to Parents

If you have children of your own, you will want to know what the psy-

chiatrist advises about telling stories to children without doing them harm.

"The intuition of parents is better than any advice of a psychiatrist," Dr. Lorand says on this point.

"The story must obviously be suited to the child's age and condition. Care should be taken that the tale is told in the right physical and physiological setting. The time of the day when story telling takes place is of course important. No ogre story before bedtime," Dr. Lorand warns.

If the child is timid and nervous, the stories should be especially selected so as not to frighten him.

In general, stories like Cinderella and The Sleeping Beauty are better than ones filled with witches and ogres. Pinocchio, a great favorite with many children, can be made too frightening.

Story-telling should not be limited to one parent.

The chief point about telling stories to children is to remember that you are telling it for the child, Dr. Lorand emphasized. If the mother is in a hurry and resents having to tell the story, tells it quickly to get it over with, her child will detect the resentment or bored sense of duty in her voice. This will puzzle and worry him and add to his conflict instead of helping to ease it.

Likewise the parent should know whether telling the story becomes an outlet for herself and should check any tendency in this direction. Otherwise the story may become a story for an adult and not for a child and will fail in its purpose of helping the child.

Injected Her Mood

This happened in the case Dr. Lorand reported of the thirty-year-old man who never outgrew the fairy tale state of mind. His mother was herself a timid, apprehensive type. When she told him the stories she was more interested in her own situation as a lonely wife awaiting the return of her husband than in the child's problems. Telling the stories had a comforting effect on her and relieved her own tension, but the way in which she told them had a harmful effect on her son. It was only after much misery that he turned to the psychiatrist for aid. Fortunately in this case the treatment was successful and the patient recovered. For the last three years he has been entirely well and free from the bugaboos of fairyland.

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Science News Letter, November 3, 1934



KEEP THE OGRES AWAY

Let the kind fairies and pleasant happenings fill the bedtime stories you tell your children.

MEDICINE

Cancer Cases Reported From Medicinal Arsenic

CASES of skin cancer caused by arsenic-containing medicines taken for other conditions have caused Drs. Clifford C. Franseen and Grantley W. Taylor of Boston, Mass., to issue a warning to physicians to be very cautious in giving arsenic as medicine.

Nine cases definitely due to arsenic and five more cases probably caused by arsenic are reported by them (*American Journal of Cancer*, October). In two of the cases, the patients had been exposed to arsenic in the form of a spray for fruits and vegetables. But arsenic given as medicine for the relief of skin diseases and blood disorders caused the cancerous condition in the majority of the cases. The arsenic-containing medicine had been taken by some of the patients as long as forty years before the cancerous condition appeared.

Arsenic has been a common constituent of quack cancer pastes, Drs. Franseen and Taylor also pointed out. They hold it has no place in the treatment of cancer.

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TECHNOLOGY

Rubber Becomes Rival of Cellulose for Wrapping

CELLULOSE, in the recent years of the world's great industrial revolution has been the stuff in which much of our everyday goods are wrapped. Whether an old newspaper, a shoebox, or a newer shimmery transparent sheet, fundamentally they are cellulose, one of the basic chemicals of wood, cotton and other plants.

Now there comes a rubber product to complete in this expanding field of wrappings. The new rival of Cellophane and its transparent cellulose associates is called Pliofilm and it is made by the Goodyear Tire and Rubber Co. It is produced synthetically from rubber by processes requiring the same careful control given to cellulose products.

Noteworthy, Arthur D. Little's *Industrial Bulletin* explains, is Pliofilm's retention of its moisture-proofness on wrinkling, creasing and related types of abuse that reduce or eliminate the effectiveness of most other "moisture-proof" wrappers in practical use. This moisture-proofness is a property of the

film itself, a unique distinction in the transparent wrapping field. Pliofilm is not greatly affected by changes of humidity in the atmosphere, and its producers claim that it has greater tear-resistance and more elasticity than the cellulose type of sheet. It does not have the stretchable elasticity one thinks of in connection with rubber, but rather a toughness, with some "give." Its light weight—more than 20 per cent. extra area per pound compared with the usual cellulose type—will have an important bearing on its economy in actual use.

Coupled with its moisture-proofness, Pliofilm's property of "heat sealing" will be of interest to package specialists who have followed the early difficulties in sealing other "water-proof" types of film. Only moderate heat and pressure are required for producing a strong, permanent seal of two edges.

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PHARMACY

Takes Bitter Taste Out Of Medicine; Adds Value

BY FINDING a way to take the bitter taste out of certain medicines, Dr. James C. Munch, director of research at Temple University School of Pharmacy, has not only made himself the friend of many patients who rebel at the unpleasant doses they must swallow but has also added to the benefit they can derive from the medicines.

In the case of quinine, bitter but effective malaria remedy, for instance, the use of proper solvents for the drug makes it possible for the physician to give doses five to six times as strong as could previously be administered.

A medicine can be so bitter that it is impossible to take it, Dr. Munch pointed out.

Before beginning this research it was necessary for Dr. Munch to establish a standard taste scale, for bitterness is a matter of degree. Once having established this scale, so that it was possible to say that something was twice as bitter as something else, it was necessary to find certain inert solvents or carriers for the drugs that would in no way affect the drugs themselves. Drugs were found to be more bitter in some solvents than in others. The first tests were made with strychnine. Dr. Munch said, regarding these tests:

"The tongue is more sensitive than the most delicate chemical reaction."

Science News Letter, November 3, 1934

IN SCIENCE

PHYSIOLOGY

Human Eye, Like "Electric Eye," Sums Up Flashes

NEW studies on how the eye responds to flashes of light lasting only from one 100,000th to one 10,000,000th of a second were reported to the Optical Society of America by Dr. J.W. Beams, of the University of Virginia.

The findings, having applications in the physiology of the human eye, reveal that length of the light flashes is not a vital factor in the way the eye receives the light energy. The eye, the research discloses, sums up or integrates the light energy—at least over the range of frequency of flashes studied.

This integrating ability of the human eye, Dr. Beams reports, makes it kin to the photoelectric cell or so-called "electric eye" which also has the property of integrating short light flashes. The photographic plate does not have this property, Dr. Beams said.

The light flashes, lasting only millionths of a second, were obtained by the rapidly rotating mirror driven by air with which Dr. Beams has been able to obtain speeds of 20,000 revolutions per second. In the present research, he declared, such high speeds were not necessary and a rotation of only 1,600 revolutions per minute was used.

Light from an incandescent lamp reflected from the many sides of the revolving mirror produced the extremely short light flashes. Since the flashes followed one another so rapidly no flicker was apparent to the eye and the flashing light could be compared directly with a steady source and "matched."

Science News Letter, November 3, 1934

ENGINEERING

Beauty Cooperates With the Engineer

See Front Cover

INTERIOR of one of the transmitters built in the Bell Telephone Laboratories for the Central American radiotelephone service is the subject of the illustration on the front cover of this week's SCIENCE NEWS LETTER.

Science News Letter, November 3, 1934

SCIENCE FIELDS

ORNITHOLOGY

Only Few Birds in U. S. Now Hide Nests From Study

BIRDS have no privacy any more. With the discovery of the breeding ground of Harris' sparrow, scientists now know where all but four or five kinds of birds of the United States build their nests and hatch their eggs.

The Smithsonian Institution here has just received specimens of the nest and eggs of the pretty Harris' sparrow discovered recently near Churchill, in Hudson Bay country. The nest and eggs fill one of the last gaps in the Smithsonian's bird collections. The specimens were collected by Miss A. M. Heydweiller, Cornell biology student.

Harris' sparrow flies south in winter, as far as the Midwestern states. But the summer home remained hidden until recently because the sparrows nest in a restricted district and the nesting area was traced only through intensive search.

Science News Letter, November 3, 1934

CHEMISTRY

Maple Flavor Concentrated From Sap for Export

EXPERIMENTS in the laboratories of the Canadian National Research Council have resulted in the discovery of a way to process the sap of the sugar maple tree so that the maple flavor may be extracted from it in greatly concentrated form. The work is the direct result of an attempt to improve the Canadian maple sugar industry, now hard hit by the strengthened United States tariff wall.

Rather than try to export maple sugar, as such, to the United States, the Canadians now have worked out a way to send to the U. S. A. the essentials of flavor which have wide use in ice cream manufacture, soda fountain products, soft drinks, baking and related industries.

The new process consists of adding to the ordinary maple liquid some volatile fluid like ethyl alcohol in which

the sugar of maple sugar will not dissolve. The addition of the alcohol, in fact, makes the sugar present crystallize out and leaves the maple flavor behind in the alcohol.

Next the alcohol is freed of its maple flavor and used over again, while the flavor is obtained in concentrated form.

When still more concentration is desired the already concentrated maple flavor is put through the same process again and each time a bit more maple sugar is removed. The process has recently been patented in the United States.

Science News Letter, November 3, 1934

ORNITHOLOGY

Bald Eagles Slaughtered For Indians' "Millinery"

BALD eagles of the British Columbia coast are being wantonly slaughtered by Siwash Indians, to meet a brisk cash demand caused by the vanity of male Indians of other tribes far to the south, in the United States. Thus reported Dr. George Miksch Sutton, curator of birds at Cornell University, before the recent meeting of the American Ornithological Union.

The Siwash, he said, sell the wings for a dollar apiece and the tails for fifty cents. These trophies find their way southward and inland, being used by the Plains Indians and the Pueblos and Hopis of the Southwest for the "millinery" the braves still affect. By the time the feathers reach the Pueblo-Hopi country, in the hands of white traders, they are priced at a dollar each. Dr. Sutton also called attention to the need for better-enforced protection for the rare trumpeter swan in the Knight's Inlet region, which are being mercilessly hunted.

Dr. Sutton was leader, during the past summer, of a joint expedition into British Columbia, undertaken by the University and by the Carnegie Institution of Washington. After several weeks of work in the coastal straits and inlets, the party, known officially as the John B. Semple Ornithological Expedition, moved inland over the mountains and into the drier country.

Two outstanding achievements of the expedition were the finding, for the first time in forty years, of an identified and perfect egg of the marbled murrelet, and the collection of a black pigeon hawk.

Science News Letter, November 3, 1934

ENGINEERING

Railroads May Save \$180,000,000 Yearly

AMERICAN railroads, hard pressed in the competitive transportation battle, have their hands on the lid of a treasure chest which may yield \$180,000,000 a year.

The potential fortune for railroads consists of the little gaps between each rail on the 300,000 miles of main lines of the country. If the small gaps were removed, it is estimated that five years would be added to the life of railroad rails. And the industry would save its \$180,000,000 in decreased depreciation of equipment quite aside from accompanying maintenance.

The railroads believe they have found the key to the treasure chest in welded joints between the rails. The tiny quarter and half inch cracks between consecutive rails would be eliminated. The track would be one continuous piece.

Railroad passengers would find in the improvement a quieter, smoother ride. To the railroads rail gap elimination would mean great financial saving for the removal of what makes the "click-click" of carwheels on rails coincides with the reduction of battering at these joints. Depreciation of equipment, both rolling stock and rails, would be cut markedly. For class one, main line tracks alone, the saving would be the aforementioned \$180,000,000.

But what about the expansion and contraction of the rails from the scorching days of summer to the frigid periods of a hard winter? asks the layman with some knowledge of physics.

Engineers have found that there is a wide difference between the theoretical expansion of steel rails and the actual change of length. In Germany it is noted that the expected change does not take place. In Australia rails up to 225 feet long show actual expansion and contraction just one-half the theoretical change. In America the change is only one-third that calculated.

H. S. Clarke, maintenance engineer of the Delaware and Hudson Railroad, speaking at the recent meeting of the American Welding Society in New York, described how experimental sections of track up to 2,800 feet long have been studied by this railroad since August, 1933. Three hundred welds were used in these sections of track. No trouble was experienced on this section despite the extremely cold winter of 1933-1934.

Science News Letter, November 3, 1934

ASTRONOMY

Planets Have Composition Similar to That of the Sun

THE earth and the other planets are apparently made of the same stuff as the sun.

Prof. Henry Norris Russell, the Princeton astronomer, discussing the subject at Mt. Wilson Observatory, Calif., observed that not only are the same elements present to a large extent both on the sun and the earth, but that contrary to previous notions there seems to be about the same proportions of each in the two cases. This fits the notion that the planets were formed of masses of matter ejected from the surface of the sun.

The new ideas on this subject came about from an investigation of the interior as well as the surface, or crust, of the earth. Of course, one cannot get down to the center of the earth, but with the help of chemical and seismographic studies scientists (especially Dr. V. M. Goldschmidt of Göttingen) have been led to the conclusion that the earth has a 2,000 mile core, called the siderosphere, composed of metallic stuff, mostly iron, cobalt and nickel. The earth's gold and platinum are also concentrated there where we can never get at them.

Outside the core is a dense shell or chalcosphere of sulfur compounds. Up towards the surface is a crust or litho-

sphere of more familiar material, mainly silicates. On the very surface, of course, is the hydrosphere and above it the atmosphere.

Some substances common in the sun are apparently less common on the earth because they are concentrated in the lower regions where we can not get at them. Sometimes substances are apparently rare because they mix with anything and do not form minerals of their own. For example, scandium and germanium were thought to be exceedingly rare on the earth, but fairly common on the sun. It is now known that there is plenty of scandium but it is so widely and thinly scattered that it never makes much of an impression.

It is lucky for us, Prof. Russell said, that the carbon and oxygen are mainly in the lithosphere, hydrosphere and atmosphere for these elements are essential to life as we know it. Actually about half of the original oxygen of the atmosphere has gone to make iron rusty, for that is the reason why we find red clay and sandstone. Ultimately all of the oxygen of the atmosphere will be removed by iron and then the human race will have to manufacture its own breathing material. Probably that explains the situation on Mars, which

has little atmosphere and practically no oxygen. The original oxygen must have combined with the iron to form rust and it is this rust which gives the planet its ruddy appearance.

Carbon dioxide, which is essential to plants, is continuously being exuded from the interior. But plants, especially those in the sea, are turning it back into minerals such as calcite. If there were no plants the atmosphere would become loaded with carbon dioxide and presumably that is what has happened on the planet Venus which has been found to have such a heavy atmosphere of this gas.

Thus, everywhere in the solar system the original materials seem to be the same, but the history of their development has been different in each case and has left on the surface different substances. This lends strong support to the already plausible notion that the matter in the planets was once part of the surface of the sun.

Science News Letter, November 3, 1934

ENGINEERING

World's Largest Elevator, Lifting Ships, Being Made

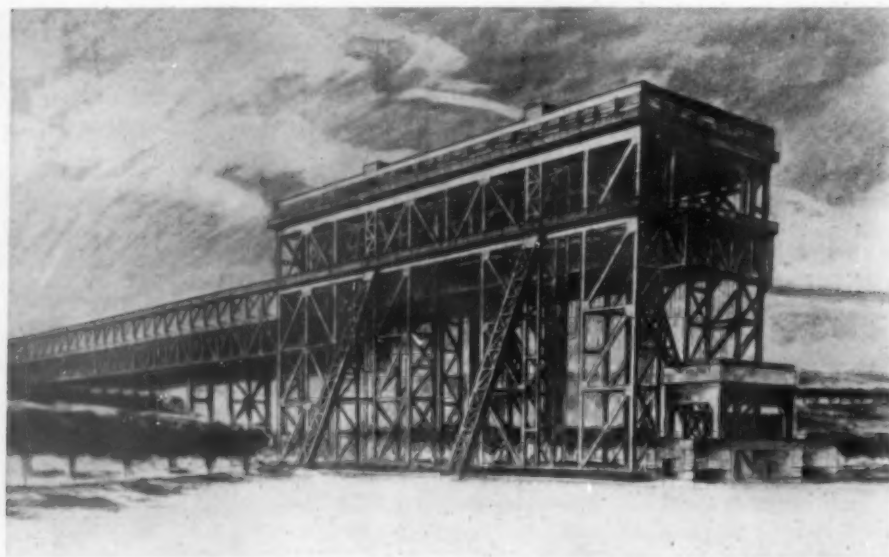
THE WORLD'S largest elevator is nearing completion in Germany. It will lift, not men or merchandise, but whole ships weighing up to 1,000 tons.

Another step to make Berlin an ocean seaport, the huge ship elevator is more than half completed at Niederfinow on the Oder River. The foundations are finally finished and within three years the completed structure is expected to lift river steamers 120 feet—as high as a ten story building—in about twenty minutes.

At Niederfinow now, series of canal locks do the same thing but take two hours for a single boat. A marine traffic problem likened to some of New York's taxicab jams results with undesirable frequency. Sometimes a hundred vessels were waiting to go through the locks and had to stand idle for days for the "lift" that sent them on their way.

After a vessel steams into the elevator tank, only five minutes is expected to be required to raise the tank with its contained water and ship up 120 feet. The additional fifteen minutes are needed to bring the vessel in and out of the tank.

Actually the weight to be lifted on each trip is about 4,200 tons or some 8,400,000 pounds. But nearly all of



LARGEST IN THE WORLD

Architect's drawing of an elevator, now under construction in Germany, which will be able to lift an entire ship.

this is compensated for by a system of counterweights. So delicately will the giant structure be poised that engineers estimate only four electromotors of 75 horsepower each will be required to raise and lower the elevator.

Germany's problem of bringing Berlin closer to the Baltic Sea—or what amounts to the same thing, allow larger

vessels to sail right into Berlin—utilizes the navigation of the Oder River to Niederfinow and a ship canal from there to Berlin. This is the famous Hohen-zollern Kanal which, near Eberswalde, passes over a railroad instead of beneath a railroad bridge as is the normal practice.

Science News Letter, November 3, 1934

MEDICINE

First Anti-Influenza Serum Is Produced in Horse

British Scientists Who Last Year Isolated Virus Of Influenza Announce Mice Can Also Be Used

AN anti-influenza serum has been produced in a horse by the three British scientists who last year isolated the influenza virus. The same scientists have found a way of systematically using mice, the most widely available of all animals used in medical research, for their intensive experiments in the long-continued war against flu.

This dual announcement is made (*The Lancet*, Oct. 20) by Drs. C. H. Andrewes, P. P. Laidlaw and Wilson Smith, all of whom are working at the National Institute for Medical Research Farm Laboratories, at Mill Hill, a suburb of London.

Dr. Laidlaw was last November awarded the Royal Medal of the famous Royal Society of London for his part in discovering a vaccine for protecting dogs from distemper, which is believed to be the canine counterpart of flu.

The isolation of the influenza virus reported by these physicians last year, since confirmed in America by Dr. R. Shope of the Rockefeller Institute at Princeton, N. J., resulted from their having previously discovered that ferrets are susceptible to infection with human influenza.

Only Animal

The extreme importance of this discovery was due to ferrets being the first animals in which systematic infection with human influenza was shown to be possible. Before last year it had seemed to many scientists that the only way to tackle the flu problem thoroughly was to call for human volunteers, who, living for the time as laboratory animals, would allow themselves to be deliberately infected with the disease so that its

cause, cure, and prevention might be intensively studied, and who might, of course, die. Earlier experiments with apes and monkeys had occasionally given hope that these animals might be used for this purpose, but further trials had proved that results were negative more often than not, and that certainly no dependability of response to infection could be expected.

Rapid progress has followed the use of ferrets. What is at present its zenith is referred to in the *Lancet* report quite briefly only:

Five Mice

Drs. Andrewes, Laidlaw and Wilson Smith state that five mice given mixtures of virus and undiluted serum—the serum from a horse which had been hyperimmunized with tissue from ferrets that had been infected with a strain of human influenza—survived, while five controls (which, of course, did not receive the serum) all died.

Last year's discovery enabling ferrets to be infected with flu was an essential step in the obtaining of the serum from a horse.

Details concerning this horse serum will, the doctors add, be published later. For the moment medical men and laymen alike have to wait as patiently as possible for the promised full account of what may prove to be one of the most important medical advances for many years.

Meanwhile it must not be forgotten that these three scientists have made another discovery of the first importance. They have learned a method—probably the only method—by which mice can be infected, with more or less

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complete regularity, with the virus of human influenza. The method consists of inoculating the virus directly into the respiratory tract, preferably into the nostrils under light anaesthesia. It was because this method had not previously been systematically tried that earlier experiments with mice suggested that they were not susceptible to influenza.

The three authors of the *Lancet* report state with characteristic modesty that they have published it chiefly so as to give other workers the opportunity to use mice for the study of influenza during the coming winter. It is certain that this opportunity will be widely and quickly utilized, for the mouse is one

of the cheapest and most easy to handle of laboratory animals, and is, of course, far more common and also less physically delicate than the ferret.

A certain number of ferrets may, however, be necessary to the pursuit of these researches, at least at present, for the occurrence of a flu epidemic is needed before the British or other scientists can tell whether mice can be infected with virus directly from the throat washings of man. Drs. Andrewes, Laidlaw and Wilson Smith have used as the infecting agent a virus which, though of human origin, has been repeatedly passed through ferrets.

Science News Letter, November 3, 1934

OCEANOGRAPHY

Gulf Stream Really Does Not Originate in Gulf of Mexico

THE Gulf Stream does not originate in the Gulf of Mexico, two years of research by the Bingham Oceanographic Laboratory of Yale University have determined. Prof. Albert E. Parr, scientific director of the Yale oceanographic expeditions, in charge of this work, now believes that the name "Gulf Stream" is a misnomer and should be changed.

The first known oceanographic survey of the Gulf of Mexico was made in the winter of 1932 by the Yale oceanographic expedition on the "Mabel Taylor," with the cooperation of Drayton Cochran, Yale '32, of New York City. The many observations made during this survey have subsequently been analyzed in the Bingham Laboratory at Yale. According to Prof. Parr, the work has progressed far enough to make it possible to say that the upper layers in the Gulf of Mexico are made of waters

quite different from that of the upper layers of the Caribbean and also of the Gulf Stream.

Gulf of Mexico water seems to enter into relatively very little exchange with the waters of the surrounding seas and generally contributes little or nothing to the waters of the Gulf Stream, Prof. Parr and his co-workers have found.

"The observations made," declares Prof. Parr, "provide evidence to prove the theory already advanced by Danish investigators that the so-called Gulf Stream simply takes the shortest possible route from the Yucatan Channel to the Straits of Florida along the north coast of Cuba, carrying chiefly or exclusively waters brought directly from the Caribbean, with little or no contribution at all from the Gulf of Mexico.

"The popular name of the Gulf Stream is therefore certainly a misnomer, and should be replaced by a more



SCIENCE FOR UNDERSTANDING THE PROBLEMS of YOUTH

an address by

Dr. William Healy

Director of the Judge Baker Guidance Center, Boston

Tuesday, Nov. 6, at 4:15 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

suitable designation such as, for instance, the term 'Florida Current' which is now gaining wider usage among oceanographers and nautical people. Perhaps 'Caribbean Current' would really be the most fitting designation," Prof. Parr added.

Science News Letter, November 3, 1934

CHEMISTRY

Vitamin Structure Secrets Probed With Ultraviolet

VITAMIN B₁, one of the earliest members of the now famous family of vitamins, and also one of the most mysterious, is beginning to yield its secrets. Dr. Francis F. Heyroth and Prof. John R. Loofbrow, of the Basic Science Research Laboratory, University of Cincinnati, investigating crystals of vitamin B with ultraviolet light, have found that they are built on the type of a substance known as pyrimidine, which contains a group of atoms made up of four carbons and two nitrogens in a ring. (*Nature*, Sept. 22.)

The eventual discovery of the structure of the vitamin is important because it may lead to its preparation synthetically. A deficiency of vitamin B₁ in the diet of man leads to the disease known as beri-beri.

The difficulty in determining the chemical structure of the vitamins lies in the fact that the preparations have very great potency and the scientists can not easily tell whether the activity of the substance isolated is not due to some small content of an associated substance. Several samples of material used by Dr. Heyroth and Prof. Loofbrow came from Dr. Atherton Seidell of the U. S. Public Health Service's National Institute of Health.

Science News Letter, November 3, 1934



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THE MIGHTY FALLEN

This great sequoia tree of the Yosemite, so huge that stage-coach horses have been stabled in a burned-out place in its base, has at last succumbed to the flames that wounded it more than 200 years ago. The man pictured standing on the trunk seems Lilliputian beside the bulk of its roots.

BIOCHEMISTRY

Find New Rickets-Preventing Substance Not Vitamin D

VITAMIN D is not the only thing that can prevent rickets. A new rickets-preventing substance which is not vitamin D and which differs from the vitamin somewhat in chemical composition has been reported by Prof. Lester Yoder of the Iowa State College and Iowa Agricultural Experiment Station (*Science*, Oct. 26).

The new substance has the long chemical name of cholesterilene sulfonic acid. Its rickets-preventing power has been determined in laboratory experiments, but it is not at present being put forward as a substitute for vitamin D. In fact, in order to protect the public from such substitution before more is known about the effect of the new substance on the body, Prof. Yoder proposes to take out patents on it.

Scientific interest in the new substance lies in its chemistry. It is made from cholesterol, a fatlike substance found in bile and egg yolk and other animal tissues. Vitamin D is made from ergosterol, a chemically related sub-

stance. Ultraviolet light activates ergosterol to produce vitamin D. Fuller's earth activates cholesterol to produce the new anti-rachitic substance. The activating constituent of the fuller's earth in this case was found to be sulfuric acid or its anhydride.

In the early days of vitamin research, the rickets-preventing power of vitamin D was thought to be caused by cholesterol, but scientists soon found that this power was lacking in pure cholesterol and only present when that substance was contaminated by ergosterol and that the vitamin was formed by activation of the contaminating ergosterol. More recently Drs. F. C. Koch, E. M. Koch, and I. K. Ragins, of the University of Chicago, reported that provitamin D could be formed from cholesterol itself as well as from ergosterol. Dr. Yoder's work has confirmed this and shown the chemistry by which a rickets-preventing substance may be formed from cholesterol.

Science News Letter, November 3, 1934

DENDROLOGY

Big Tree 2,000 Years Old Crashed After Windstorm

MIGHTY even in its overthrow, one of Yosemite's Big Trees, estimated to be nearly 2,000 years old, lies stretched along the ground in Mariposa Grove.

The old sequoia, widely known as the Stable Tree because of a great burned-out place in its base in which horses were stabled in stage coach days, was 269 feet high and 291½ feet in diameter at its base.

The fall of the Stable Tree is attributed by park authorities to the great fire scar which had burned out its center more than two hundred years ago, greatly weakening its hold in the ground. A recent windstorm loosened the giant's already weakened foothold and two days later, during a period of absolute calm, it toppled over and measured its length on the ground.

Although it struck with tremendous force, the huge trunk remains unshattered for three-quarters of its length, breaking off only at the top. Every branch, some of them three feet thick, snapped off close to the trunk. A great crater was left where the roots had been.

Science News Letter, November 3, 1934

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Land-Saving Roots

MILK is becoming increasingly impressed on the American public consciousness—even upon the public conscience. It is freely asserted that none of us is really getting enough milk, and in especial, that the children of the great mass of the people are grievously undersupplied with this essential food of childhood.

The results of the national milk survey have already started a great drive for the production and consumption of more milk, and hence to bring about the breeding of many more milch cattle and the increase of acreage devoted to pasture and the raising of their particular types of feed.

Such a reapportionment of agricultural land may reasonably be expected to have a number of beneficial effects on the land itself. Secretary Wallace has been insisting, with a persistent reiteration worthy of one of his own favorite Old Testament prophets, that more of our acreage now in clean-cultivated, ero-

sion-provoking crops should be put back into permanent grass. A great increase in dairying would make this economically feasible, even necessary, rather than an act of sacrifice to prevent further eating away of the bare-surfaced soil by water or wind.

But cows do not live by grass alone. It is also recognized dairy practice to supply cows with "concentrates"—feeds given in the barn rather than in the pasture, such as the meals of alfalfa, cottonseed and soy beans, not to forget that old-time standby, clover hay.

Increased demands for these concentrates would apparently also work beneficially on the land. Alfalfa, clover and some of the other plants in their class are semi-permanent crops, affording at least partial protection against erosion. They have deep root systems, thus tapping the lower strata of the soil for water, especially during drought, and for mineral nutrients at all times. They

harbor soil-enriching colonies of nitrogen-fixing bacteria.

Soy beans are of less value as erosion-checkers, but they are at least efficient nitrogen-capturers. As relative newcomers on the agricultural scene, they are deserving of encouragement in a program calling for greater crop diversification, especially in the South. And the value of a better market for the by-products of cotton, like cotton seed meal, will not need laboring.

These, to be sure, are only a few elementary factors in the question. The task of putting America on a more-milk, more-cows basis will not be simple, nor its accomplishment come without friction. But land as well as children will undoubtedly profit through the ministration of the cow, so that the job must be undertaken with determination, and wrought upon with understanding and patience.

Science News Letter, November 3, 1934

MEDICINE

Discover New "Factor" of The Pituitary Gland

DISCOVERING a new hormone from the body's master gland, science may have a clue to the cause of stomach ulcers.

The new product of the pituitary gland seems to stimulate the stomach to pour out increased amounts of hydrochloric acid. This discovery has just been made and reported by scientists at the Courtauld Institute of Biochemistry of the Middlesex Hospital of London.

It may mean that it will be found that a disorder of the pituitary is the cause of stomach ulcers. Excess hydrochloric acid is found in cases of stomach ulcers.

This excess acid is believed by some scientists to be a cause or part of the cause of this condition. The London discovery also ties in with the finding of an American scientist, Dr. Harvey Cushing, that stimulating the base of the brain near where this gland is located may produce stomach ulcers.

The new glandular product comes from the hind part of the pituitary gland. It was discovered by Drs. E. C. Dodds, R. L. Nole and E. R. Smith. With characteristic scientific reserve and caution, they report (*The Lancet*, Oct. 27) that their findings "suggest the probability of a new posterior pituitary

hormone." They call it a "factor."

They think they have discovered either a new hormone or a new, hitherto undiscovered property of an already known pituitary hormone which affects blood pressure. The editor of *The Lancet* considers the new substance more likely to be an entirely new hormone.

In their investigations the London scientists injected under the skin of forty rabbits a special extract from the hind or posterior part of the pituitary gland. This produced marked injuries in the fundus or acid-producing area only of the stomachs of all the rabbits. The same effect was obtained when the rabbits were fed very large doses of the standard posterior pituitary extract prepared according to the directions of the British Pharmacopeia.

The doses given both by mouth and by injection under the skin were so large that the newly-discovered factor that injured the rabbits' stomachs would appear to be negligible in the ordinary doses of posterior pituitary prescribed for patients. What effect the new hormone has on the body in the small quantities normally produced by the pituitary gland is not yet known with certainty.

Science News Letter, November 3, 1934

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Science News Letter, November 3, 1934

Sociology

RADBURN, A PLAN OF LIVING—Robert B. Hudson—*American Association for Adult Education*, 118 p., \$1.25 (\$1.00 to A. A. A. E. members). Radburn is a community within Fair Lawn, New Jersey, designed and built by experienced architects and community planners to provide salaried persons of moderate income with homes in which to enjoy life. The wealth of community activities, and provisions made for them, are described.

Science News Letter, November 3, 1934

Electronics

ELECTRON TUBES IN INDUSTRY—Keith Henny—*McGraw-Hill*, 490 p., \$5.00. A gathering of scattered references on the use of electron tubes in industrial processes. Only when the field is viewed as a whole—as in this book—can it be realized how widespread is the dependence of industry on the vacuum tube in its wide ramifications.

Science News Letter, November 3, 1934

Biography

EDISON, HIS LIFE, HIS WORK, HIS GENIUS—William A. Simonds—*Bobbs-Merrill*, 364 p., \$3.50. Since books on the life of Edison first began to appear in 1879 it seems difficult to believe that any unknown facts about the life of the great inventor have not been discovered.

Mr. Simonds has, however, unearthed a "lost" grandfather of Edison and added him to the family tree in his rightful place. The author had the opportunity of probing the famous Menlo Park laboratory while Edison was still alive. Mainly he is interested in Edison "the man," agreeing with Will Rogers that "Edison would have been a grand fellow if he had never invented anything." Frank J. Sprague—early associate of Edison, Annapolis graduate and "Father of Electric Traction"—appears in the book as a member of the British Royal Navy!

Science News Letter, November 3, 1934

Physics

FOUNDATIONS OF PHYSICS—Alfred M. Butler—*M. Barrows*, 613 p., \$2.00. Designed for high school and non-college preparatory students. Replaces the author's well known *Household Physics*. Over seventy pages are devoted to how and why radio works, a topic not usually explained so fully in elementary texts.

Science News Letter, November 3, 1934

Science

THE ADVANCEMENT OF SCIENCE, 1934—*British Association for the Advancement of Science*, 232 p., 3s 6d. The annual volume in paper cover that brings together the valuable presidential addresses delivered before the British Association for the Advancement of Science. This volume contains those delivered at Aberdeen in September.

Science News Letter, November 3, 1934

Silviculture

THE THEORY AND PRACTICE OF SILVICULTURE—F. S. Baker—*McGraw-Hill*, xiv, 502 p., \$5. Another valuable addition to the American Forestry Series. We are going in for a lot of forest-planting in this country in the near future, and it behooves us to see the planting of a forest as something quite different from just sticking a lot of any kind of trees into any kind of soil, anywhere, and then bidding the poor things, "Grow!" A forest is a community of trees as a town is a community of people; successful modern forest planting is as different from the old go-as-

you-please method as modern town planning is different from the haphazard growth of sprawling prairie settlements or the mushroom mining camps of the Old West. Books like this will help the new generation of forest planners.

Science News Letter, November 3, 1934

Sociology

THE FAMILY—M. F. Nimkoff—*Houghton, Mifflin*, 526 p., \$3.00. Intended as a textbook for the newly established courses on the family in colleges and high schools. Four general chapters on the structure and functions of the family and the historic background are followed by others discussing the biological, economic, and psycho-social aspects of the modern American family. Cases from the Institute for Family Guidance, Lewisburg, Pa., of which the author is director, are used for concrete illustration.

Science News Letter, November 3, 1934

Chemistry

MYSTERY EXPERIMENTS AND PROBLEMS—J. O. Frank and Guy J. Barlow—*J. O. Frank & Sons, Oshkosh, Wisconsin*, 187 p., \$2.25. This book is the answer to the prayers of busy instructors in chemistry and physics for more demonstration experiments which will catch student interest with a touch of mystery and, at the same time, explain some principle of science. It will be valuable to every lecturer who probably knows a few of the experiments and would like to know more.

Science News Letter, November 3, 1934

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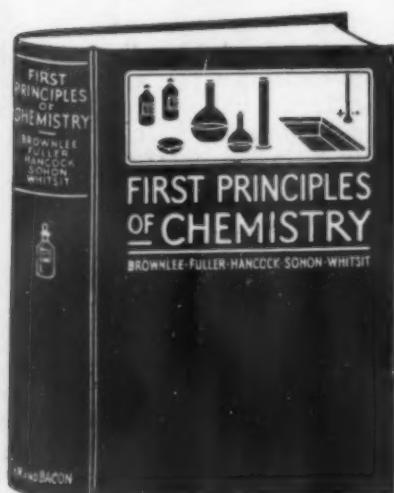
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THE WORLD OF CHEMISTRY

WE LIVE our lives amid material things. To the understanding of this environment man has given centuries of toil and thought. Slowly superstitions have given way to scientific facts. Great minds have delved in obscurity to bring forth scientific principles. When these were numerous enough and became properly classified, the sciences of today came into being.

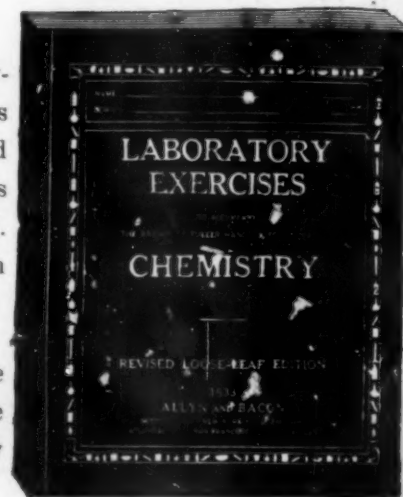


The pathways to the sciences were not dull and humdrum, for along the road lay adventure, romance, and even tragedy. Ever the scientist sought the truth. Always he regarded his labors as vain unless he gave a better understanding of the world about him and turned his discoveries to the service of mankind.

Chemistry offers a rich field to the inquiring mind and brings great reward to those who understand its teachings. It is of constant practical value. It tells how to select proper materials for every kind of construction. It has rendered available many metals and special alloys that make our trains, automobiles, and airplanes more serviceable. It has made the soil more fertile and has revealed the nature of our food. It shows us that the human body is a living chemical laboratory, and that even thought has a chemical basis.

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